



MATERIAL SAFETY DATA SHEET  
COMPLIES WITH 29 CFR 1910.1200.  
OSHA HAZARD COMMUNICATION RULE

DATE OF LAST REVISION: 05-15-96

---

## CHEMICAL IDENTITY

---

LABEL IDENTITY	<b>RUTHENIUM</b>
FORMULA	<b>Ru</b>
CHEMICAL FAMILY	<b>METAL</b>
HAZARDOUS INGREDIENTS: %: <b>100</b>	TLV/PEL: <b>NOT SET</b> CAS # <b>7440-18-8</b>

---

## PHYSICAL AND CHEMICAL PROPERTIES

---

COLOR, FORM AND ODOR	<b>Lustrous hard metal or powder, no odor</b>
BOILING POINT	<b>4150</b>
DENSITY (gm/cc)	<b>12.45</b>
VAPOR PRESSURE @ 20°	<b>NA</b>
% VOLATILE BY VOLUME (%)	<b>NA</b>
REACTION WITH WATER	<b>None</b>
EVAPORATION RATE (H2O=1)	<b>NA</b>
SOLUBILITY IN WATER	<b>None</b>
MELTING POINT	<b>2450° C (Melting)</b>
SPECIFIC GRAVITY (H2O=1)	<b>ND</b>
OTHER	<b>ND</b>

---

## FIRE AND EXPLOSION HAZARD DATA

---

FLASH POINT	<b>NA</b>
AUTOIGNITION TEMPERATURE (°C)	<b>NA</b>
FLAMMABILITY	<b>Flammable as fine powder</b>
EXTINGUISHING MEDIA	<b>Agents for metal fires such as dry graphite, MET-L-X or TEC.</b>
SPECIAL FIRE FIGHTING PROCEDURES	<b>Do not use water on metal fires. Smother fire with Class D distinguishments or allow fire to burn. Wear full protective gear.</b>
UNUSUAL FIRE & EXPLOSION HAZARDS	<b>Burning Ruthenium emits Ruthenium Oxide, an irritating and toxic material.</b>

---

## HEALTH HAZARD INFORMATION

---

THRESHOLD LIMIT VALUE:	<b>ND</b>
ROUTES OF ENTRY	<b>INHALATION</b>
EFFECTS OF OVEREXPOSURE (acute and chronic):	
INHALATION:	<b>No data on effects of inhalation of ruthenium metal. Ruthenium tetroxide fumes are reported to be severely irritating and injurious to the mucous membranes and lungs. No data on chronic effects.</b>



## RUTHENIUM MATERIAL SAFETY DATA SHEET

**DERMAL/EYE: No data. Ruthenium tetroxide has been reported to be highly irritating to the eye.**

**OTHER: Ruthenium and its salts are considered slightly toxic based upon laboratory animal studies.**

---

CARCINOGENICITY: **NO** NTP: **NO** IARC MONOGRAPHS: **NO** OSHA REGULATE: **NO**

---

### EMERGENCY FIRST AID PROCEDURES:

**INGESTION: Give victim fluids, then induce vomiting. Seek medical help.**

**INHALATION: Remove to fresh air. If exposure was to oxide fumes, seek immediate medical attention.**

**SKIN CONTACT: Wash affected area with soap and water.**

**EYE CONTACT: Flush eyes immediately with plenty of water for at least 15 min. If exposure was to the oxide, seek medical attention.**

---

### REACTIVITY DATA

---

STABILITY	<b>Stable</b>
INCOMPATIBILITY (MATERIALS TO AVOID)	<b>ND</b>
HAZARDOUS DECOMPOSITION PRODUCTS	<b>Ru04</b>
HAZARDOUS POLYMERIZATION	<b>Will Not Occur</b>
CONDITIONS TO AVOID	<b>None</b>

---

### SAFE HANDLING AND USE

---

#### STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:

**Scoop or sweep up and remove.**

#### WASTE DISPOSAL METHOD:

**Safe for precious metal recovery.**

---

### SPECIAL PROTECTIVE INFORMATION

---

RESPIRATORY PROTECTION	<b>Any respirator approved for dusts mists and fumes.</b>
LOCAL EXHAUST	<b>To control exposure to dust and fumes</b>
MECHANICAL (general)	<b>Adequate for non dusty work</b>
OTHER	<b>NA</b>
PROTECTIVE GLOVES	<b>Any glove to limit skin contact</b>
EYE PROTECTION	<b>Safety goggles</b>

---

### SPECIAL PRECAUTIONS

---

PRECAUTIONS TO BE TAKEN IN HANDLING/STORAGE: **Wash thoroughly after handling.**



## RUTHENIUM MATERIAL SAFETY DATA SHEET

TRANSPORTATION REQUIREMENTS

DOT CLASS: **Not Classified**  
UN NUMBER: **NC**  
IMCO CLASS: **NC**  
OTHER: **--**

PRECAUTIONARY LABELING

NONE

---

THE ABOVE INFORMATION IS ACCURATE TO THE BEST OF OUR KNOWLEDGE. HOWEVER, SINCE DATA, SAFETY STANDARDS AND GOVERNMENT REGULATIONS ARE SUBJECT TO CHANGE THE CONDITIONS OF HANDLING AND USE, OR MISUSE ARE BEYOND OUR CONTROL, **ANGSTROM SCIENCES** MAKE NO WARRANTY, EITHER EXPRESSED OR IMPLIED, WITH RESPECT TO THE COMPLETENESS OR CONTINUING ACCURACY OF THE INFORMATION CONTAINED HEREIN AND DISCLAIMS ALL LIABILITY FOR THE RELIANCE THEREON. USER SHOULD SATISFY HIMSELF THAT HE HAS ALL CURRENT DATA RELEVANT TO HIS PARTICULAR USE.

NA= NOT APPLICABLE

ND= NO DATA FOUND